

## Chapter Four: Amtrak *Cascades* Program Components

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Adding or expanding passenger rail service along an existing freight corridor typically requires the existing infrastructure to be upgraded and/or improved. This infrastructure consists of a number of elements—all of which contribute to the rail line’s ability to handle needed capacity and provide safe and reliable passenger rail service. These components include:

- Upgrading grade crossings to ensure safe passage of trains, vehicles, and pedestrians;
- Increasing speeds to improve corridor capacity and travel times;
- Enhancing train control signals to improve corridor capacity, increase train speeds, and enhance safety;
- Purchasing new passenger train equipment to operate along the corridor to increase frequencies and decrease travel time;
- Improving stations and their ability to serve neighboring communities and to provide connections to other modes of travel; and
- Upgrading tracks and facilities to relieve congestion, improve ride quality and safety, increase train speeds, and improve corridor capacity.

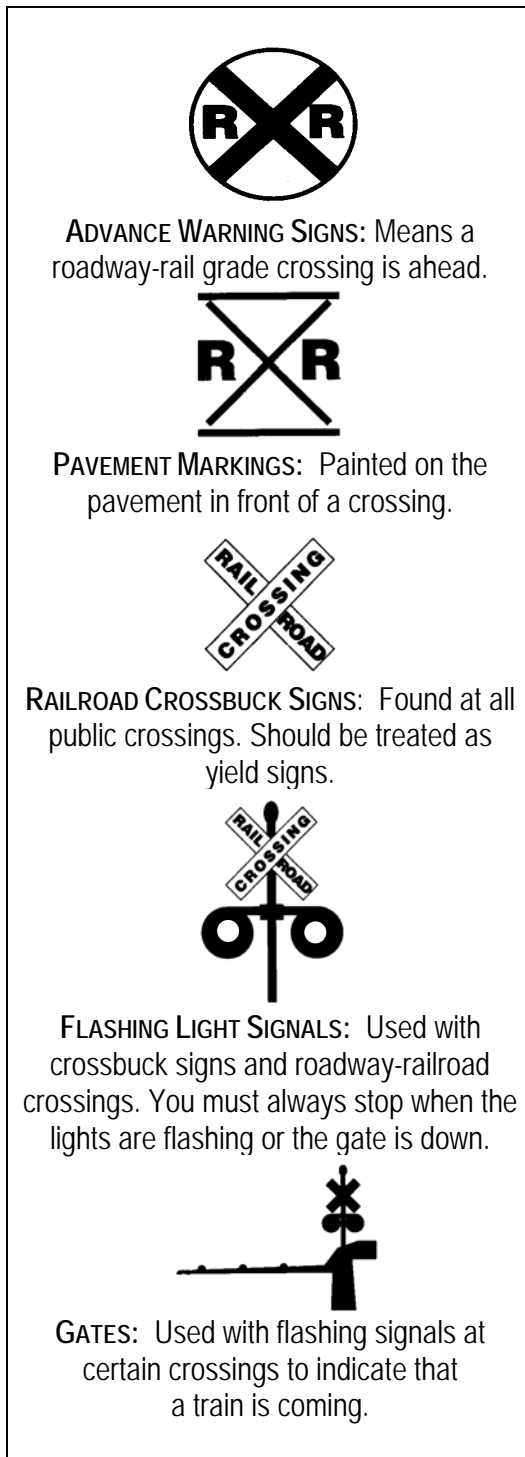
This chapter discusses these types of capital improvements and their relationship to the service goals presented in Chapter Three of this document. Once improvement types and locations are finalized, the Washington State Department of Transportation (WSDOT) will work with participating agencies and organizations to allocate costs for each improvement.

### Why are grade crossing upgrades needed?

Grade crossings are designated places where cars, trucks, buses, bicyclists, and pedestrians cross the railroad tracks. At-grade crossings are locations where the roadway and the tracks cross each other at the same elevation. Grade-separated crossings are places where the roadway goes over the railroad tracks or the tracks go over the roadway. Most crossings along the corridor are at-grade.

Depending upon the speed of the train and the amount of vehicular traffic that crosses the tracks, federal guidelines recommend certain types of warnings at the crossings.

**Figure 4-1**  
**Types of Railroad Grade Crossing**  
**Warning Signs**



## Types of grade crossing warning signs

Upgrading crossings can help improve safety, increase train speeds, and reduce local traffic congestion. Warning devices are designed on a site-specific basis, taking into account rail traffic, vehicular traffic, and accident history.

Warning devices can range from simple markings on the roadway alerting drivers and pedestrians of railroad tracks, to complete grade separation. Grade-separated crossings are expensive and often not warranted for low volume and low-speed intersections. All grade crossings have some form of warning, from signs to active warning devices that include flashing lights and gates. Active warning is used at virtually all grade crossings in urban areas. New technologies, beyond signals and gates, are being developed and tested that enhance safety but do not require grade separations. As these new technologies are tested and approved, safety guidelines may be revised to include them. **Exhibit 4-1** illustrates some of the warning devices in common use today.

Safety improvements at grade crossings are being made along the corridor. The Freight Action Strategy for Seattle-Tacoma-Everett (FAST) program has targeted a number of grade crossings for closure or separation. Through this and other programs, including the Pacific Northwest Rail Corridor program, WSDOT is working with communities and the BNSF Railway Company (BNSF) to identify grade crossings that may need enhanced warning signals, grade separation, or other treatments to enhance safety.

In addition, to ensure safe passage across the tracks, WSDOT will continue to work with communities to enhance, consolidate, or close designated crossings for pedestrians and automobiles and to educate them about the necessity to heed warning devices and not to go around gates or ignore flashing lights. Since virtually all railroad corridors are actually private

right of way, crossing them at other than designated public crossings is not only dangerous, it is also considered trespassing.

## Why are speed increases needed?

Higher train speeds reduce travel times, resulting in better passenger and freight service. Speeds are limited by safety requirements, by the train signaling system, and by track design. Trains typically cannot go fast around sharp curves or up steep grades.

A number of agencies have the authority to set speed restrictions. In general, under the authority of the Revised Code of Washington (RCW) 81.48.030, the Washington Utilities and Transportation Commission (WUTC) has the authority to set speed limits at all grade crossings in unincorporated areas and in all cities (except first class cities<sup>1</sup>). However, federal regulations preempt the state from setting speed limits except where unique local safety conditions exist. As a result, the WUTC can set speed limits only where such conditions warrant a deviation from Federal Railroad Administration (FRA) track safety standards.

BNSF and Amtrak have been working with local jurisdictions and the WUTC to increase freight and passenger speeds to keep trains running on schedule in the corridor. These two rail operators, in conjunction with WSDOT, will continue to spearhead speed increases throughout the corridor.

Current maximum speeds set by the FRA for the current type of track and signal system along the corridor are seventy-nine miles per hour (mph) for passenger and sixty mph for freight service. As part of its guidelines, the FRA has recommended specific grade crossing treatments. As discussed above, these treatments range from gates and lights at a railroad crossing to complete grade separation.

In the future, the maximum speeds of Amtrak *Cascades* trains will be 110 mph. These higher speeds will only be achieved when all of the required safety systems and track improvements have been completed.

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<sup>1</sup>A first class city is a city with a population of ten thousand or more, at the time of its organization or reorganization, that has a charter adopted under Article XI, section 10, of the State Constitution. Per RCW 35.22.280, first class cities are granted the power to regulate and control the use (and vacation) of streets.

## **Why are enhanced train signals and communication systems needed?**

Enhancements to the existing signal and communication systems along the rail line are crucial for the development of better passenger service in the corridor. Signal and communication systems, such as Centralized Traffic Control (CTC), route and monitor the location and direction of trains on the tracks. Upgrading these systems can help improve safety, increase the number of trains that can simultaneously use the rail system, and reduce the time it takes to get from one place to another.

Improved signal and communications along the rail corridor will allow Amtrak, Sound Transit, and BNSF to run more trains safely and efficiently.

## **Why are new passenger trains needed?**

In order to increase the number of trains that serve the corridor over the next twenty years, new train equipment will be needed. After years of research and negotiations, WSDOT and Amtrak selected Talgo trains for this corridor. With the purchase of the first set of Talgo trains in January 1999, Amtrak *Cascades* service was introduced. These trains, the first owned by the state, not only allow WSDOT to increase frequencies along the corridor, but also offer added passenger comfort and increased speed.

### **Why does this new equipment allow for increased speed?**

Amtrak *Cascades* trains use passive tilt technology. Consequently, they can run at higher speeds than conventional trains on existing tracks. The tilt system has air springs in the main suspension that allows the train to tilt naturally. This tilting allows the trains to run thru existing curves at higher speeds while maintaining passenger comfort and safety. The system is considered passive because motors do not operate it; the passive tilt system functions with no energy consumption and requires minimal maintenance. Because of this design, many of the sharp curves on the corridor will not have to be eliminated, thus resulting in fewer costly construction projects.

Although these new trains are capable of traveling at speeds exceeding 125 mph, they currently must travel at a maximum speed of seventy-nine mph in our region until additional improvements to tracks, crossings, train control and safety systems are completed.

## What are some of the features of the trains?

Amtrak *Cascades* trains typically include one baggage car; standard coaches with thirty-six seats each; one accessible coach with nineteen seats that complies with the American with Disabilities Act (ADA); one bistro (cafe) car; one lounge car; one business class coach with twenty-six seats; and one ADA-accessible business class coach with eighteen seats. Each car is approximately forty-four feet long, about half as long as standard Amtrak coaches.



**Assembly of Talgo Trains in Seattle, 1998.**

The number of coaches in each train can vary by route and schedule, based upon customer demand. Currently, the trainsets each have 250 seats, but they can be modified in only a few hours to accommodate as few as one hundred passengers to nearly three hundred passengers.

Onboard safety features include clearly marked, removable emergency windows; emergency lights; first aid kits; and fire extinguishers. The new trains meet U.S. Environmental Protection Agency standards for air conditioning refrigerants, U.S. Food and Drug Administration standards for food service, and ADA accessibility standards.

Washington State and Talgo conducted public outreach to obtain input from the physically-challenged community to ensure that Amtrak *Cascades* trainsets serve the full public. Amtrak *Cascades* trains are among the most accessible in the world and are the first to provide independent wheelchair accessibility between cars.

## How many trains will be needed by year 2023?

The Amtrak *Cascades* operating plan indicates that by year 2023, twelve trainsets will be needed to meet the service goals outlined in this document. WSDOT currently owns three trainsets and Amtrak owns two.<sup>2</sup> **Exhibit 4-2** outlines the number of trains needed over the next twenty years. The year that an additional trainset may be needed is based on a number of assumptions. As stated earlier in this document, the service levels and years of projected service increases are based on the assumption that funding for this program has been provided and the necessary infrastructure projects have been completed. Maintenance and preservation of this equipment is a key component of the equipment plan. Two of the new trainsets will be used in a back-up capacity to ensure that service is not disrupted if a trainset is in need of repair or maintenance. **Appendix C** provides more detailed information about WSDOT's equipment preservation plan.

**Exhibit 4-2**  
**Passive-Tilt Trainsets for**  
**Amtrak Cascades Service between**  
**Portland, OR, Seattle, and Vancouver, BC**

Service Year or Timetable	Required Number of Trainsets
2003	4
A	5
B	6
Mid-Point (C)	7*
D	9*
E	11**
2023 (F)	13***
Spare Sets (See Notes)	2

Notes: \*includes one spare set  
\*\*includes two spare sets  
\*\*\*includes three spare sets

## How are passenger rail stations being upgraded?

Throughout the corridor, intercity passenger rail stations (Amtrak stations) have been undergoing expansion and renovation. Since the early 1990s, WSDOT has been working with local communities to upgrade existing passenger rail stations throughout the state. The state of Oregon has also been working with local cities to upgrade their facilities.

Between Portland, OR and Vancouver, BC there are currently thirteen Amtrak stations (eleven in Washington, one in Oregon, and one in British Columbia). The condition, size, and amenities of the stations vary widely.

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<sup>2</sup>The five trainsets currently in use include service between Portland, OR and Eugene, OR – which is outside of this plan's discussion. For the corridor discussed in this plan (Vancouver, BC to Portland, OR), four trainsets are used.

However, the most important factor for all of these stations is their ability to serve future passengers. As WSDOT implements its program, each station will need to be revisited to ensure that the existing roadway system surrounding the station can accommodate more vehicles and buses. In addition, walkways and bicycle paths should be added to a number of these stations, and additional bicycle racks should also be added at each station. Other factors that will need to be revisited include the amount of available parking. Communities along the corridor have been upgrading their stations to meet such future needs.<sup>3</sup>

The following discussion presents an overview of each of the Amtrak stations between Portland, OR and Vancouver, BC. **Appendix D** has more information about each of these stations.

### Union Station (Portland, OR)

Union Station was built in 1896 and has been in continuous operation since that time. The station is located at 800 NW 6th Avenue in downtown Portland. This station serves Amtrak *Cascades* trains as well as Amtrak long-distance trains. In 1987, the Portland Development Commission acquired the station. It is the current owner of the station and Amtrak is its tenant.

**Exhibit 4-3**  
**Portland's Union Station**  
**800 NW 6<sup>th</sup> Avenue**



Union Station is a large, historic station. Since 1987 it has undergone substantial renovation. It is wheelchair accessible and is in compliance with the Americans with Disabilities Act (ADA). There is a staffed ticket office in the station. General station amenities include restrooms, telephones, a news stand, and a restaurant.

<sup>3</sup>Sound Transit is implementing its Sounder Commuter Rail program between Lakewood and Everett. Sounder trains will share stations with Amtrak Cascades trains in Everett, Edmonds, Seattle, Tukwila, and Tacoma. Separate plans and environmental documents are currently being produced by Sound Transit regarding these station area impacts to surrounding communities.

Greyhound Bus Lines and a Tri-Met (the city's transit provider) bus facility are located one block from the station, providing both intercity and local transportation connections. Tri-Met also plans to add a new MAX light rail stop adjacent to Union Station within the next few years. Fourteen Tri-Met bus routes serve Union Station. Burnside Avenue, a major east-west arterial, is just south of the station. Union Station is easily accessible by auto, bicycle, and on foot. Bicycle racks are located at the station. In addition, there are two City Center parking lots with approximately two hundred public spaces and seventy-five tenant spaces located at the station. Several taxi companies also serve the facility.

## Vancouver, WA

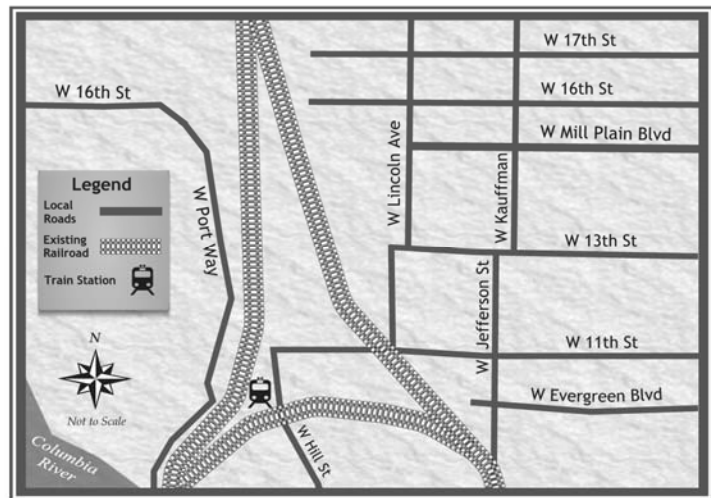
Vancouver Station is located west of the downtown area near a major track junction, where tracks branch off from the Portland, OR to Seattle line to head east through the Columbia River Gorge. The station was built in 1908.

Vancouver's unique two-sided station is eligible for

placement on the National Register of Historic Places. Partial renovations were completed in 1988, and the city is currently securing grant funds for a more thorough renovation. Plans include renting the second floor of the station as a community meeting space. In 2001, the city of Vancouver purchased the rail station from the BNSF.

Station amenities include restrooms, telephones, vending machines, and a staffed ticket office. There are ninety-five free parking spaces at the station, and taxi service is available.

**Exhibit 4-4**  
**Vancouver, WA Amtrak Station**  
**1301 West 11<sup>th</sup> Street**





## Kelso Multimodal Transportation Center (Kelso/Longview)

The Kelso Multimodal Transportation Center is located in downtown Kelso along the Cowlitz River. The building was constructed in 1912, and an award-winning renovation was completed in 1995. The station is owned by the city of Kelso and also serves as the terminal for Greyhound bus service and the local Community Urban Bus System (CUBS),

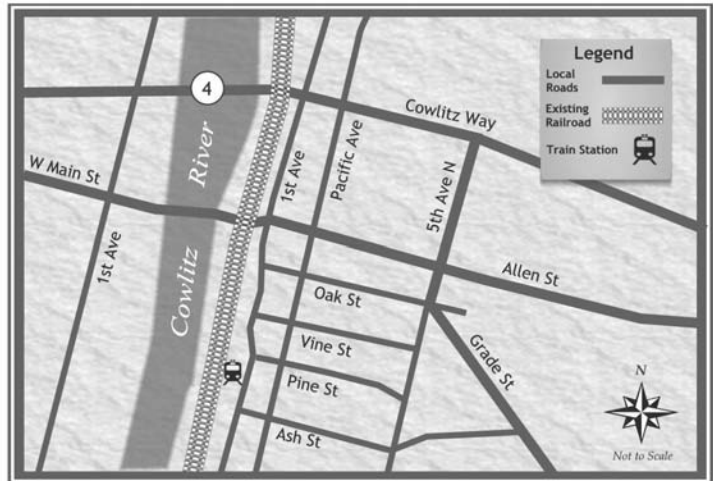
which has offices in the building. The city of Kelso plans to lease space in the station to retail and food purveyors. Currently, the station is serving as City Council chambers and an informal community meeting space until a new City Hall is built.

Station amenities include restrooms, telephones, vending machines, a QuikTrak automated ticket machine, eight bicycle lockers, forty-five free parking spaces, and public meeting space on the lower level.

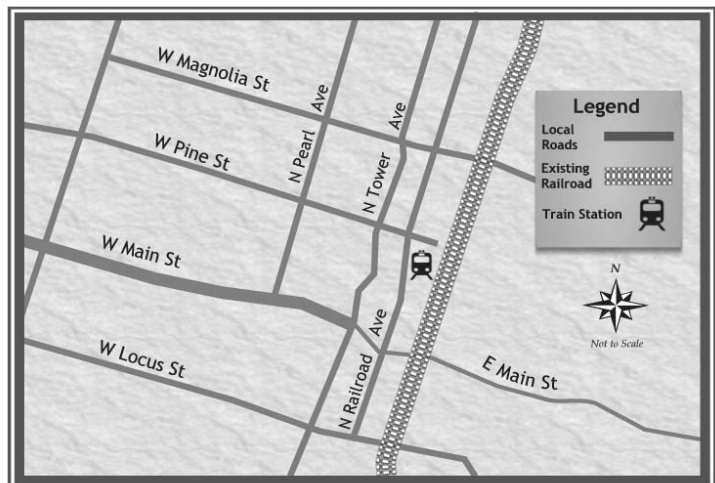
## Union Depot (Centralia)

Centralia's Union Depot, built in 1912, is located in the heart of downtown Centralia. The depot was restored throughout the 1990s, preserving much of the original décor and historical elements. The

**Exhibit 4-5**  
**Kelso's Multimodal Transportation Center**  
**501 South First Avenue**



**Exhibit 4-6**  
**Centralia's Union Depot**  
**210 Railroad Avenue**



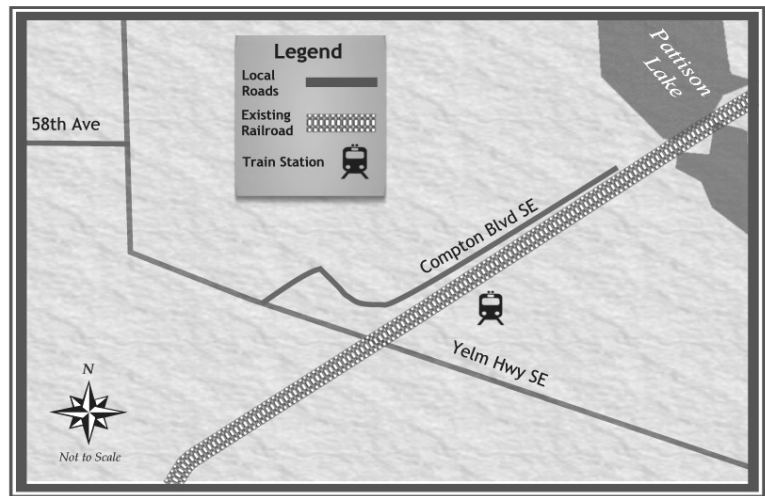
historic building includes a brick exterior, a tile roof, heavy oak millwork, ornate ceilings, and leaded windows. Improvements to the city-owned building include restoration of the building's interior, new office spaces on the depot's second floor, an elevator, and a new community meeting space. Eventually, a real-time passenger information system will be installed in the waiting area and on the depot platform.

Amenities include restrooms, vending machines, telephones, and a staffed Amtrak ticket office. There are ninety-six free parking spaces at the station and in the immediate vicinity. Taxi service and local transit bus service, run by Twin City Transit, are also available. Regional bus companies offer daily service to east Lewis County and to Grays Harbor County. The entire depot is ADA compliant.

### **Centennial Station (Olympia/Lacey)**

Centennial Station opened in 1992 and serves the Lacey, Tumwater, Yelm, and Olympia areas of Thurston County. Intercity Transit, the county's local transit authority, owns the facility. The station is entirely operated by volunteers and was built through donations. Local enthusiasts have been instrumental in expanding and maintaining the station since it opened in 1992. While the surrounding area is growing quickly, the station is in a remote area some distance from the cities' centers. Amenities include restrooms, vending machines, telephone, a QuikTrak automated ticket machine, and bicycle lockers. The entire station is ADA compliant. Intercity Transit runs local bus service from the station. The bus runs every hour, and service to downtown Olympia takes approximately forty-five minutes.

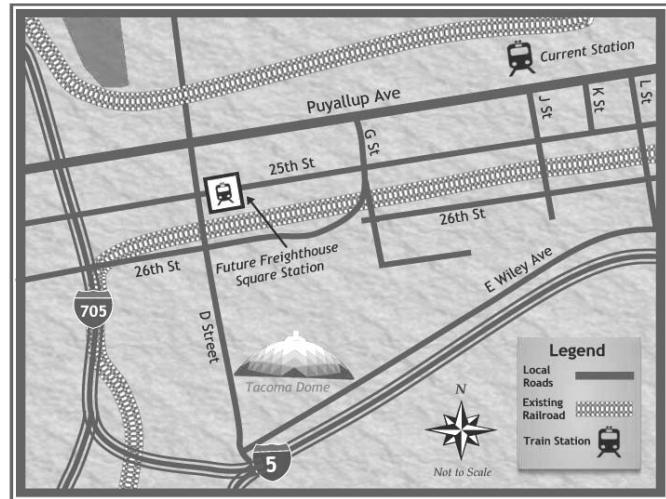
**Exhibit 4-7**  
**Olympia/Lacey's Centennial Station**  
**6600 Yelm Highway SE**



## Tacoma Dome Station at Freighthouse Square (Tacoma)

The current facility, located at 1001 Puyallup Avenue, was constructed in 1984 and is owned by the BNSF. Amenities include a staffed Amtrak ticket office, restrooms, telephones, vending machines, a QuikTrak automated ticket machine, and a waiting area. The station is also served by Northwestern Trailways, Pierce Transit, and local taxis. Two parking lots provide free parking with approximately eighty stalls.

**Exhibit 4-8**  
**Tacoma Dome Station at Freighthouse Square**  
**425 East 25<sup>th</sup> Street**



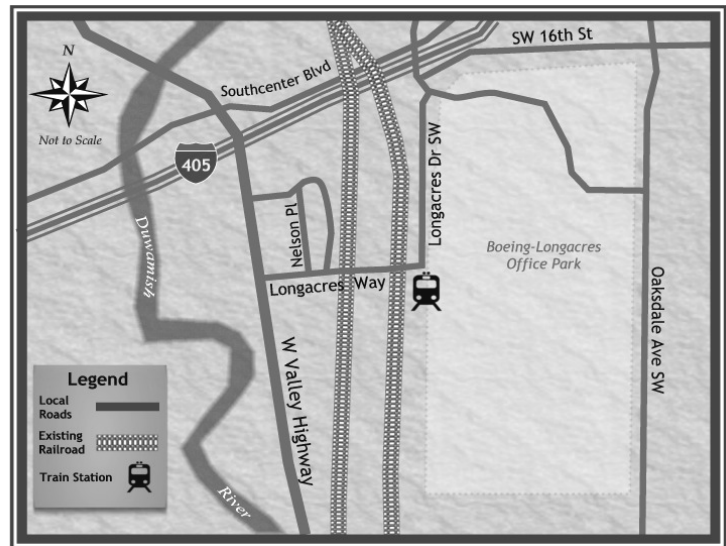
Freighthouse Square, one-half mile southwest of the existing Amtrak Station, is the Tacoma stop for Sound Transit *Sounder* commuter rail. Amtrak *Cascades* will begin operating out of Freighthouse Square within the next ten years. Transit links will be available at the nearby Tacoma Dome Station. The Tacoma Dome Station is an intermodal facility that accommodates parking, Pierce Transit bus service, Sound Transit Regional Express bus service, and Greyhound. Sound Transit's Tacoma *Link* light rail line runs along East 25<sup>th</sup> Street, directly across from Freighthouse Square.

**Exhibit 4-9  
Tukwila Station  
7301 South 158<sup>th</sup> Street**

**Tukwila**

Tukwila Station is located twenty minutes south of downtown Seattle. Tukwila's temporary train station opened in 2001. Sound Transit owns the facility, which consists of two wooden platforms with shelters and 250 interim parking spaces. The Tukwila Station serves both

Amtrak *Cascades* and *Sounder* commuter trains. (Amtrak's *Coast Starlight* does not stop in Tukwila.) Metro and Sound Transit's Regional Express bus services connect passengers to points throughout King County.

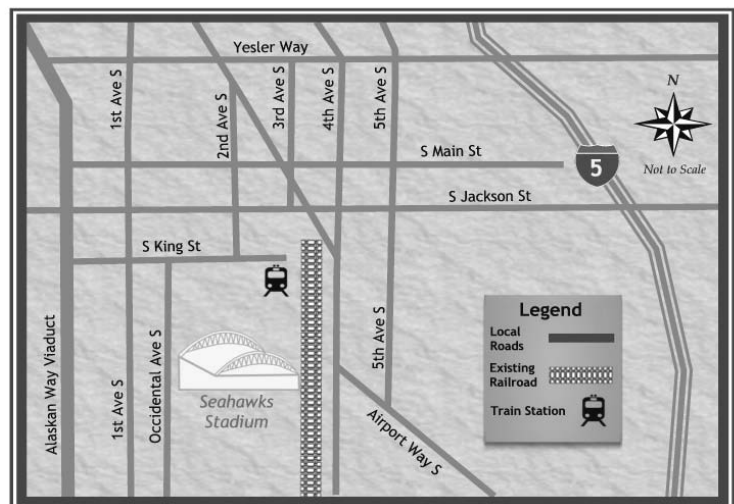


The Tukwila comprehensive plan identifies a future, permanent Tukwila station at the same location as a regional transportation hub which will promote transit-oriented development around the rail station.<sup>4</sup>

**King Street Station (Seattle)**

Seattle's King Street Station was constructed in 1906 and is owned by the BNSF. The station's

**Exhibit 4-10  
Seattle's King Street Station  
303 South Jackson Street**



<sup>4</sup>*Tukwila Tomorrow: Comprehensive Land Use Plan, Tukwila Urban Center Element, Background Report, May 2004.*

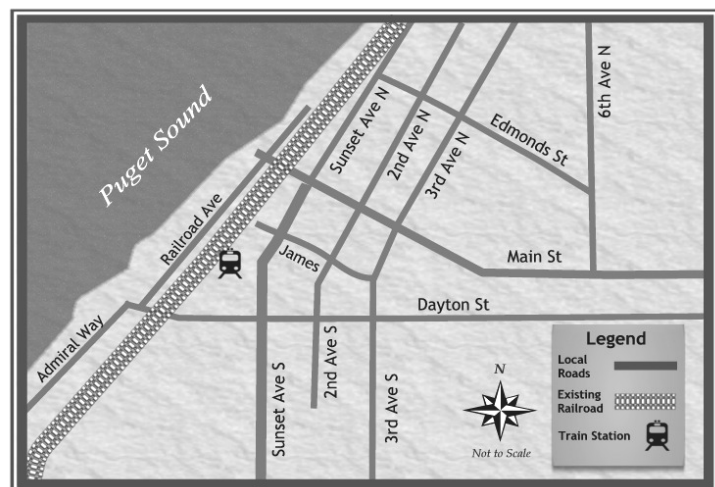
distinctive clock tower is a Seattle landmark and the building is listed on the National Register of Historic Places. Cosmetic renovations and modernization of services are currently underway. Improvements are began in late 2003. Amenities currently include restrooms, vending machines, telephones, two QuikTrak automated ticket machines, and a staffed Amtrak ticket office.

Many transportation options and services are available within a quarter mile of King Street Station. King County Metro and other regional transit providers offer bus service throughout the region and Seattle. Intercity buses to Vancouver, BC and Spokane also serve the station. Colman Dock is the departure and arrival point for Washington State Ferries to Bremerton and Bainbridge and Vashon Islands. Sound Transit's *Sounder* commuter rail and regional express bus service connect to cities throughout Puget Sound. In addition, the waterfront trolley serves the Pioneer Square neighborhood and the Seattle waterfront. Interstate 5 and State Route 99 (the Alaskan Way Viaduct) are both easily accessible from the station, as is I-90. Sound Transit's LINK light rail is planned to serve the former Union Station building, one block away.

## Edmonds

The Edmonds Station, located near the city's waterfront, is owned by the BNSF. Amenities include restrooms, vending machines, telephones, and a staffed Amtrak ticket office. Community Transit provides local transit service, and a Washington State Ferry Terminal is three blocks north of the station.

**Exhibit 4-11**  
**Edmonds' Station**  
**211 Railroad Avenue**



Future plans call for a new *Sounder* commuter platform between Dayton and Main Streets in downtown Edmonds. In addition, a proposed new Edmonds Crossing multimodal station will combine local and regional transit, commuter rail, intercity Amtrak *Cascades* service, and Washington State

Ferries. The final plans for the new Edmonds Crossing facility have not been determined.

## Everett

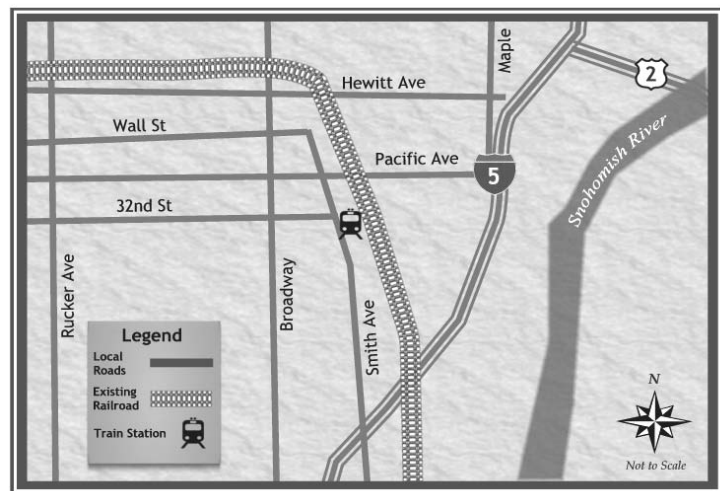
The city-owned, four-story structure provides many transportation choices, including Amtrak, Everett Transit, Community Transit Quick Bus, Greyhound, Northwestern Trailways, taxis, and Sound Transit's Regional Express bus

service. In late 2003, the station became the northernmost stop for Sound Transit's *Sounder* commuter rail. Not only does the station serve as an important transportation hub, but it is also home to higher education and career development centers. The second floor and half of the third floor are occupied

by an education center—University Centers of North Puget Sound—which includes Washington universities and colleges offering bachelors and masters degree programs. A career development center (Work Source Everett) is located on the main floor, with additional offices on the fourth floor.

Station amenities include restrooms, phones, a café, an espresso cart, a banquet and meeting room, art displays, an Everett Transit customer service office, and staffed Amtrak and Greyhound ticket offices. The station currently has twenty-five designated parking stalls for Amtrak/Greyhound passengers, eight rideshare vehicle stalls, and six bicycle racks. There are twelve bus bays and four separate park and ride lots adjacent to the station, with approximately 750 parking stalls.

**Exhibit 4-12**  
**Everett's Station**  
**3201 Smith Avenue**



### Skagit Station (Mount Vernon)

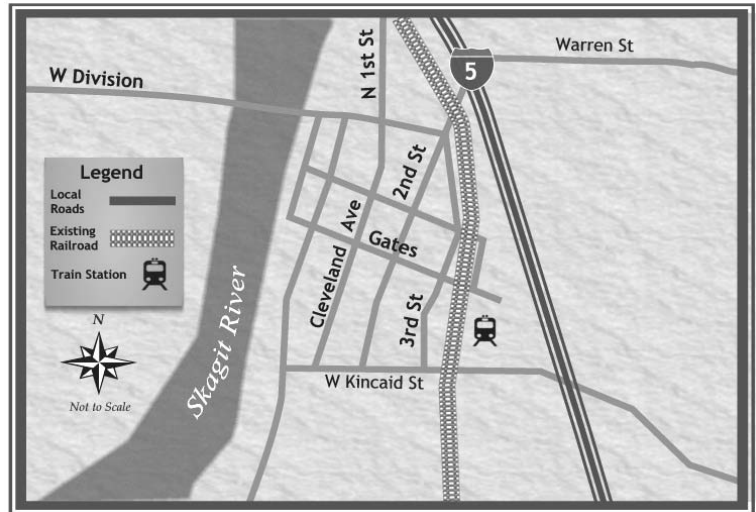
Skagit Station is the newest train station in Washington. It is located in the heart of downtown Mount Vernon. It is easily accessible and visible from Interstate 5.

Amtrak *Cascades* began servicing the station in September 2004.

In addition, Skagit Transit (SKAT), Greyhound, and local

taxi services are available at the station. It contains a meeting room fitted with advanced telecommunications capabilities. A QuikTrak automated ticket machine will be installed in 2006. The station serves as a convenient transition point for tourists destined for the San Juan Islands, Vancouver Island, and other areas of interest.

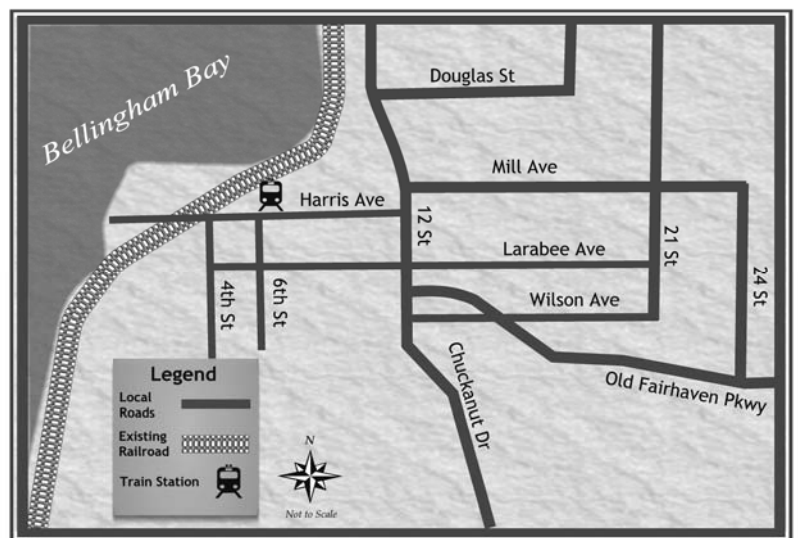
**Exhibit 4-13**  
**Skagit Station**  
**105 East Kincaid Street**



### Fairhaven Station (Bellingham)

Bellingham's Fairhaven Station is located approximately three miles south of the city's commercial center, near the Fairhaven Historic District. The building was once the headquarters of the Pacific American Fisheries Company and

**Exhibit 4-14**  
**Bellingham's Fairhaven Station**  
**401 Harris Street**



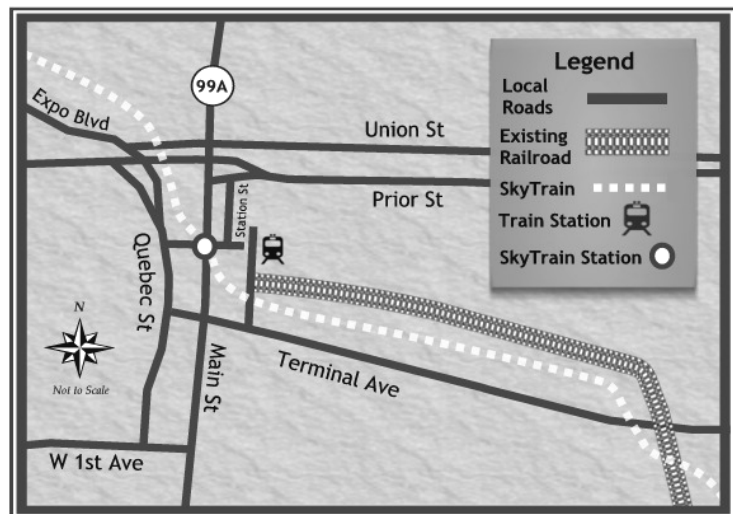
underwent extensive renovations in 1994. The station is owned by the Port of Bellingham and is part of the Bellingham Fairhaven Cruise Terminal Complex. The cruise terminal is host to Alaska Marine Highway ferries connecting to southern Alaska and a private company operating day cruises to Victoria and Friday Harbor. The facility also serves as Bellingham's Greyhound station, with local bus service provided by the Whatcom Transit Authority.

Station amenities include restrooms, vending machines, a small coffee shop, office space, a QuikTrak automated ticket machine, and a staffed Amtrak ticket office. There are eighteen free automobile parking stalls at the station, five bus bays, and eight bicycle lockers. There are 160 long-term parking stalls across from the station. Taxi service is also available. The entire station is ADA compliant.

### **Pacific Central Station (Vancouver, BC)**

The Vancouver, BC station is located at 1150 Station Street. It has undergone significant renovations since the late 1980s. Amenities include ticket agents, paid short-term and overnight parking, a restaurant, gift shop, car rental, newsstand, currency exchange, espresso bar, restrooms, and lockers. The station is wheelchair accessible.

**Exhibit 4-15**  
**Vancouver's Pacific Central Station**  
**1150 Station Street**



The station can be easily reached on foot, by bicycle, or automobile. Taxi service and local and regional bus service serve this station. Vancouver's popular Skytrain has a stop located about one block from the train station. Pacific Central Station is also home to VIA Rail, Canada's national passenger railroad.



## What other station improvements will be made throughout the corridor?

In the summer of 2003, a new Passenger Information Display System (PIDS) was installed at several stations along the corridor. The new system allows rail passengers to get real-time train arrival and departure information at each station. PIDS uses geographic positioning system (GPS) data that are transmitted directly from Amtrak *Cascades* trains. The new displays have been mounted along the platforms and near the parking lots of several stations, where rail passengers can easily observe them. Washington stations currently equipped with the PIDS are: Vancouver (WA), Kelso/Longview, Centralia, Olympia/Lacey, Everett, and Bellingham.<sup>5</sup> WSDOT and Amtrak intend to install PIDS at the remaining Washington Amtrak *Cascades* stations within the next few years, based on available funding.

## Why are improved tracks and facilities needed?

The WSDOT passenger rail program's incremental approach not only allows service to be introduced over an extended period of time, it also allows infrastructure improvements to be built over time. The following discussion presents the types of infrastructure improvements that will be necessary over the next twenty years to meet the state's service goals.



### Sidings and siding extensions

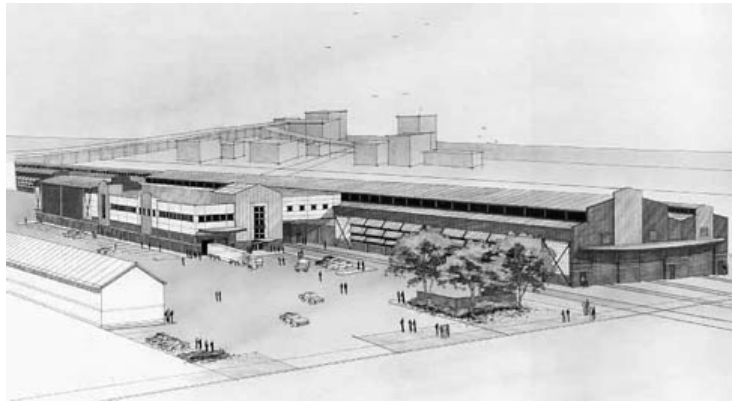
Siding tracks are secondary tracks parallel to the main line. Sidings are used to let trains on the same track pass each other—one train will switch off the main line and wait on the siding track while the other passes on the main line track.

**Sidings provide areas for trains to pass each other. They increase the capacity of the tracks.**

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<sup>5</sup>Other Pacific Northwest stations that are equipped with the PIDS are Eugene, Albany, Salem, and Portland, Oregon.

As rail corridors become increasingly congested, extensions to existing sidings and new sidings are required. Sidings provide more areas for trains to pass each other, resulting in increased capacity along the corridor.



**Artist's rendition of the new Seattle maintenance facility.**

Many of the project improvements that will be designed and constructed over the twenty-year program include new sidings and siding extensions. These projects are discussed in detail in Chapter Five of this document.

### **Rail storage, yards, and maintenance facilities**

Rail storage and maintenance facilities, and rail yards, are used to store, maintain, and sort rail cars before they are loaded, unloaded, or connected together into trainsets. Efficient rail yard activities are essential for the successful operation of both freight and passenger rail.

Additional yard improvements throughout the corridor will be necessary as rail traffic increases. More rail traffic requires larger and more efficient yard operations. Projects may consist of providing more storage tracks, larger maintenance facilities, different layouts of storage and running tracks, or additional running tracks to get trains through or around a yard.

A new Amtrak maintenance facility is being constructed south of downtown Seattle, near Safeco Field. This facility will be the primary maintenance and repair site for current and future *Sounder* commuter trains, Amtrak *Cascades* trains, and Amtrak's long-distance *Empire Builder* and *Coast Starlight* trains.



**Freight traffic and storage along the corridor.**

## Additional main line tracks

This type of project would add another main line track alongside the existing track(s). The rail corridor will include about 185 miles of third main track and about forty-six miles of fourth main track that will be used exclusively by Amtrak *Cascades* trains and other passenger rail trains. There will also be about twenty-four miles of third main track, and two miles of fourth and fifth main tracks that will be used by any traffic as necessary.



**A crossover allows trains to change tracks.**

Additional main lines are required in rail corridors when traffic congestion is significant. Additional tracks provide increased capacity just as additional traffic lanes provide increased capacity on highways.

Some of the projects presented in Chapter Five include the construction of new main line tracks. These dedicated main lines will allow passenger trains to travel on their own tracks – in certain congested areas – thus allowing them to bypass slower freight trains. Not only will the Amtrak *Cascades* service benefit from higher speeds along these dedicated tracks, but maintenance of these dedicated tracks will also be less expensive because lighter passenger trains do not wear out tracks as much as the heavier, longer freight trains.<sup>6</sup>

## Crossovers and turnouts

A turnout is a track configuration that allows a train to move from one track onto another track. Turnouts consist of a switch and a layout of track and ties. Turnouts can vary in operation and configuration. There are power-operated turnouts with switches that can be activated remotely, and manual turnouts with switches that can only be thrown (operated) manually.

Crossovers consist of back-to-back turnouts between two tracks. They allow a train to cross or move from one track to another. A train will switch off of one track and then turn onto the adjacent parallel track. Additional crossovers

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<sup>6</sup>Analysis performed by WSDOT in 2002 (and again in 2004) indicate that the maintenance cost of these dedicated tracks could be as much as sixty percent less than maintenance on mixed (freight and passenger) traffic tracks.

also provide rail dispatchers with more flexibility and reliability by adding more capacity for all users.

Crossovers and turnouts are fairly small projects and are done regularly by the BNSF as part of its maintenance and upgrade program. As part of the twenty-year program, crossovers and turnouts will be placed along the corridor as needed. These are the least disruptive and least costly types of improvements that will be added along the corridor.

### **Main line relocation**

Main line relocations occur when a track is shifted from its current location. This type of improvement may be required when a new track needs to be added within the existing rail right of way. Often moving the main line makes more space available to add another track or siding. Moving the main line could also reduce sharp curves.

### **Bypass tracks**

A bypass track is a track that goes around other railroad facilities or provides a more direct route between two points when the existing route is circuitous. It is really a siding or new main line. It may be as simple as a track that bypasses a small yard or as significant as a complete route revision. Bypass tracks are needed, in certain instances, to provide better passenger service without adversely impacting existing freight service.

### **Utility relocation**

Significant utility relocations may be required for the construction of the program's infrastructure projects. Utilities are located throughout the corridor. Some utilities, such as fiber optics, are parallel to the BNSF right of way, while many others cross under or over the railroad tracks.

Utilities will be routinely identified as part of the design process. A determination will then be made as to whether or not the specific utilities will need to be relocated or if they can remain in place. Depending on easements, rights of way and agreements, utility relocations may be done by the utility company, WSDOT, BNSF, or some combination of all three.

## **Are locations identified for these track and facility improvements?**

WSDOT and cooperating agencies and organizations have identified areas along the corridor that need track and facility improvements. Using operations analysis and railroad engineering techniques, specific infrastructure projects have been identified. Chapter Five presents these projects and their locations.